REDESCRIPTION OF *XENICOPODA* MOORE AND LEGNER (COLEOPTERA: STAPHYLINIDAE, OMALIINAE), WITH SUPPLEMENTARY NOTES*

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Introduction

Moore and Legner (1971) described a new genus and species of Omaliinae, *Xenicopoda helenae,* on the basis of a unique specimen of undetermined sex collected on Mt. Wilson, California. The major distinguishing character they noted for this genus (op. cit. and Moore and Legner, 1974) was the bizarrely modified protarsi, quite unlike any previously described in the Omaliinae.

Since then I discovered a series of six *X. helenae* in the H. C. Fall Collection at the Museum of Comparative Zoology. Examination of these specimens showed that the unusual front tarsi found on the type are present only in males. Females have normal female omaliine protarsi, slender and with equal tarsal claws. This distinct difference between the sexes and the availability of additional specimens of *Xenicopoda* made it seem worthwhile to publish an amplified description of the genus. Detailed study of the type and the six other specimens also led to the discovery of a number of discrepancies between the specimens and the original description. The proportions as given in the description and as shown in the original habitus drawing are rather distorted, owing partly, perhaps, to the fact that the type is somewhat curled up. Proportions based on careful measurements of the seven available specimens will be mentioned below. The head shape in the original drawing is rather distorted as well, and a new figure is given.

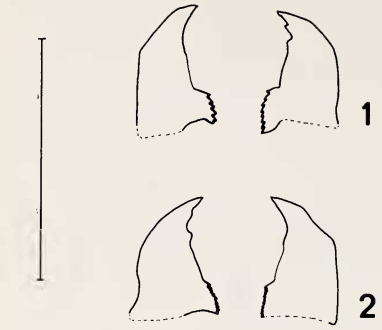
Manuscript received by the editor November 3, 1977

Redescription

Length: mean 2.5 mm (2.0–2.7 mm), measured as is (slightly curled); estimated actual length 3.0 mm (2.5–3.6 mm).

Head about seven-tenths as long as wide (from clypeal apex to nuchal constriction), epistomal sulcus absent (fig. 3). Vertex with well-impressed dorsal tentorial pits and small, rather obscure pale ocelli. (The dorsal tentorial pits are presumably what Moore and Legner (1971) meant by anterior tentorial pits. The latter are actually very slight depressions antero-medial to the antennal insertions, indicated by short lines there in figure 3.) Weak nuchal constriction across dorsal surface just behind ocelli. Faint microsculpture on dorsal and ventral surfaces of head. Labrum nearly rectangular with rounded anterior corners, about 2.2 times as wide as long; margins entire. Mandibles as illustrated (figs. 1, 2) with well-developed molar areas composed of many small, sharp, buccally directed teeth. Maxillary palp four-segmented, more or less filiform, with first segment small; second and third segments larger, subequal to each other, more or less obconical; fourth segment at least twice as long as wide (2.1–3.3x, mean 2.5x), tapering toward apex, the whole segment twice as long as the third, but narrower than its apex. Labial palp three-segmented, each segment slightly longer and narrower than the preceding; third segment two to three times as long as wide. Gular sutures distinctly separate, closest at a level just before the hind margins of the eyes and diverging anterior and posterior to this. Antenna filiform, basal segments distinctly longer than wide, more distal ones becoming successively shorter and broader up to tenth segment, which is very slightly wider than long. First five or six antennal segments glabrous except for sparsely scattered long setae; segments six or seven to eleven with shorter setae in addition. The shorter setae become progressively denser on the more distal segments, while the longer setae diminish in number and become increasingly restricted to the apical area of each segment.

Pronotum about seven-tenths as long as wide, about half as long as elytra; fairly evenly convex except for a small median basal depression; lateral margins evenly arcuate, slightly explanate in basal half; reticulate microsculpture on dorsal surface. In ventral view, postcoxal process of pronotum extends about halfway from lateral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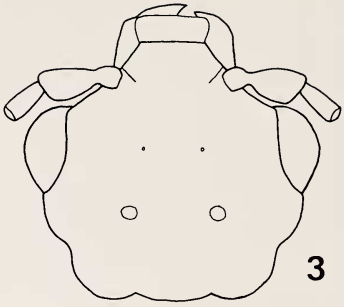
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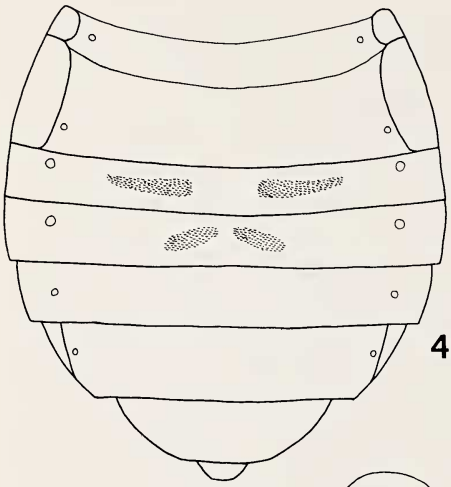
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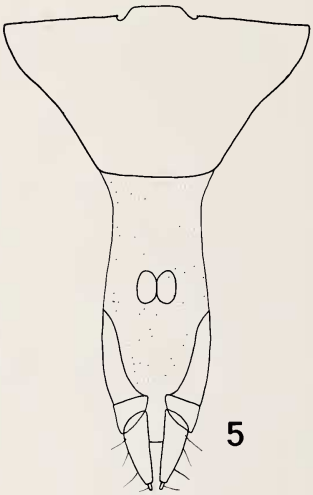
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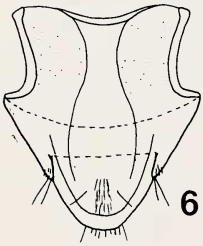
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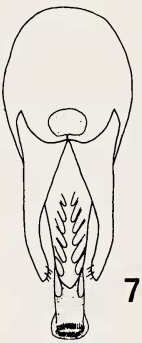
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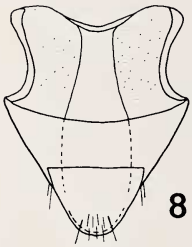
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pronotal margin to midline of prothorax. Procoxa and protrochantin very strongly and sharply carinate externally. Prosternum with short acute process barely extending between procoxae externally. Mesosternum not longitudinally carinate, having a fairly even surface with no distinct depressions fitting against procoxae; with a short rounded process between mesocoxae. Mesocoxae slightly separated, but meso- and metasternum not touching externally. Metasternum without external process between mesocoxae, with a short pair of processes between metacoxae. Metacoxa triangular in ventral view, with posterior surface slightly excavate. Apex of coxa slightly explanate laterally, overlapping part of the trochanterofemoral joint when the leg is in a retracted position. All tibiae with vague row of spines along part or all of outer face. Tibiae and tarsi slender except male prolegs as described below. Metatarsus about three-fourths as long as metatibia, first four segments subequal in length, fifth about twice as long as each of first four. Pair of empodial setae between claws on all tarsi, generally about half as long as claws.

Elytra together about 1.1 times as long as wide; without microsculpture between punctures; probably extending to about the apex of tergite 4 in life. Elytral epipleuron delimited by a distinct lateral keel. Wings fully developed, with a typical omaliine folding pattern (my unpublished data).

Abdomen with fine reticulate microsculpture on dorsal and ventral surfaces; intersegmental membranes with brick-wall pattern (with occasional irregularities) typical of Omaliinae (see Hammond, 1971); sternites of segments 2 and 3 apparently without a keel between metacoxae; tergites 2 and 3 somewhat sclerotized, 4 and following more so; tergites 4 and 5 each with a pair of small patches of medially-directed microtrichia ("pruinose" or "tomentose" spots of authors; see fig. 4); only segments 3 and 7 bearing paratergites ("margined segments"), segment 2 with sternites extending onto dorsal surface, other segments with narrow membranous joint di-

Figs. 1–8. *Xenicopoda helenae* Moore and Legner. 1–2. Mandibles; 1., ventral; 2., dorsal view. 3. Head, dorsal view (large circles = ocelli, small circles = dorsal tentorial pits). 4. Abdomen, segments 2–8 and (male) genital segment, dorsal view. 5. Eighth abdominal sternite and external female genitalia, ventral view. 6–8. Male genitalia; 6., Genital segment, ventral view; 7., Aedeagus (as positioned within abdomen), dorsal view; 8., Genital segment, dorsal view. Membranous areas of genitalia stippled. Scale line = 0.5 mm.

rectly between tergite and sternite; sternite 8 with median basal process as illustrated in figure 5.

Male: Protibia abruptly broadened just beyond base, its maximum width about twice that of a mesotibia; apical half of outer face with an irregular row of spines intermixed with a few setae; rounded notch at apex on outside of tibia. Protarsus with first four tarsomeres expanded: the first a pedunculate triangle, next three roughly triangular with their anterior apical corners successively more prolonged; ventral surfaces of first four segments with large strap-like setae (except medially); fifth tarsomere distinctly curved ventrally, apex twice as wide as base. Anterior protarsal claw much longer and thicker than all other tarsal claws, about four-fifths as long as protarsus. Posterior protarsal claw normal. Empodial setae on protarsus shorter than usual, about one-fourth as long as posterior claw. Peg setae (see Hammond, 1972) appear to be absent from legs. Genital segment and aedeagus as in figures 6–8. Aedeagus with parameres dorsal within abdomen, internal sac with dense armature.

Female: Protibia slender, similar to meso- and metatibia, spinose along entire outer face. Protarsus narrow (as meso- and metatarsus), fifth tarsomere only slightly wider at apex than at base; normal slender setae on ventral surface of tarsomeres 1–4. All tarsal claws similar in size and shape. Genitalia as in figure 5, sclerotized spermatheca apparently absent.

Material examined: CALIFORNIA: Los Angeles Co.: Mt. Wilson, 6–III–46, G. P. Mackenzie (Holotype, male) [California Academy of Sciences]; Pasadena, Echo Mt., 18–III–16, 3500 ft., (1 male, 1 female) [Museum of Comparative Zoology]; (Los Angeles Co.?) Pomona Mts., II–22 (2 males, 1 female) [MCZ]. Santa Barbara Co.: Santa Barbara, 8–II–91 (1 male) [MCZ].

Discussion

The distinctive protarsi of *Xenicopoda* males may be modified to facilitate grasping females during copulation. There seem to be no corresponding special structures in females, but both the pronotum and the elytra have fairly sharp lateral margins. Assuming that a male mounts a female dorsally (I have collected *Eusphalerum* mating this way), he might use his protarsi to grasp her pronotum or elytra in either of two ways: 1) with his tarsi dorsal and tarsal claws ventral to the lateral edge of the body; 2) with the anterior

side of the tarsus (including anterior protarsal claws) dorsal and posterior side ventral to the lateral edge of the body. The bifurcate nature of the second to fourth protarsal segments of the male and the lack of setae along the midline of the tarsus lend some credence to the latter hypothesis, but of course only direct observation of mating can confirm or deny any of this speculation. Why only one genus, out of all known Omaliinae, has these tarsi remains a mystery. The large strap-like setae on male *Xenicopoda* protarsi also may be an aid to grasping females in copulation. The presence of modified protarsal setae in at least the males is characteristic of nearly all omaliine genera I have seen (approximately 40, of which at most 5 lack these setae entirely). The form of the modified setae varies: some, like those of *Xenicopoda,* are strap-like, while others are spatulate, more or less like those of *Xanthonomus* Bernhauer, as illustrated by Steel (1955). Those of other genera form a continuum between these two types. Rarely, females also have modified setae on the protarsi, and in *Eusphalerum, Amphichroum,* and *Pelecomalium,* modified setae are found on all tarsi of both sexes, although in all these cases the setae of the males seem to be broader than those of the females. Males of several genera have modified setae on their mesotarsi as well as on their protarsi.

Most Omaliinae have a pair of paratergites on the second through seventh abdominal segments. In their description of *Xenicopoda,* Moore and Legner (1971) stated that paratergites are present on the fourth and fifth "visible abdominal segments" (=sixth and seventh segments), although their figure seems to show paratergites on the seventh and eighth segments. Examination of a cleared *Xenicopoda* specimen reveals that only the third and seventh segments bear paratergites. The second segment appears at first to have paratergites, but closer examination reveals that the sternite extends continuously onto the dorsal surface, whereas there is a membranous articulation between paratergites 3 and 7 and their respective sternites. *Xanthonomus* appears to have a similar abdomen, but has paratergites present only on the seventh segment (Steel, 1955, description and figs. 1–2; also I have examined specimens of an apparently undescribed *Xanthonomus* sp. in the Bernhauer Collection). I do not intend to imply, however, that these two genera are related because of their similarity in abdominal structure.

To include females of *Xenicopoda* in Moore and Legner's (1974) key to North American omaliine genera, couplet 29 should be

replaced by the following:

29(28) Abdomen lacking paratergites except on segments 3 and 7; male with large unequal protarsal claws, anterior one much longer and thicker than posterior, sometimes nearly as long as tarsus ..... *Xenicopoda* Moore & Legner

—Abdomen with paratergites on segments 3 through 7; protarsal claws equal in both sexes, same size as those on meso- and metatarsi 30

There are no ecological data on any of the specimens seen. Examination of one cleared specimen, however, revealed the gut to be packed with pollen grains, as in *Eusphalerum* spp., *Amphichroum* spp., *Pelecomalium* spp., and some *Elonium* spp. which are found on flowers. The presence of a mandibular mola composed of small sharp teeth is fairly restricted within the Omaliinae, but all of the above-named genera except *Elonium* share this character with *Xenicopoda.* (*Brathinus* spp. and *Olophrum* spp., which are not floricolous, also have molar surfaces composed of separate teeth, but the teeth differ in size, shape, and orientation from those of *Amphichroum, Eusphalerum, Pelecomalium,* and *Xenicopoda.*) Pollen-feeding in *Elonium* may well be a secondary development, as most species of this genus seem not to be found on flowers; this possibility makes the lack of a toothed mola in the flower-dwelling *Elonium* species less surprising. The other genera mentioned are apparently entirely floricolous as adults. This evidence and the collection dates on the seven known specimens of *Xenicopoda* suggest that an intensive search in February and March on flowers in the fairly restricted area where the genus has been collected might turn up additional specimens of this interesting beetle.

The genus *Xenicopoda* was placed in the tribe Anthophagini by its authors. For the time being it may remain there, pending badly-needed further study of the higher classification of the Omaliinae.

Acknowledgements

I would like to thank D. H. Kavanaugh, California Academy of Sciences, for the prompt loan of the type of *Xenicopoda helenae;* H. S. Dybas and E. H. Smith, Field Museum of Natural History, for the opportunity to study the type of *Xanthonomus toxopeanus*

(Bernhauer) and to borrow specimens of *Xanthonomus* sp.; Nancy Hinnebusch for typing the manuscript; and especially my husband, A. F. Newton, Jr., for continual encouragement and advice in the preparation of this paper.

References Cited

Hammond, P. M.

1971. The systematic postition of *Brathinus* LeConte and *Camioleum* Lewis (Coleoptera:Staphylinidae). J. Ent. (B) **40**(1): 63–70.

1972. The micro-structure, distribution and possible function of peg-like setae in male Coleoptera. Ent. Scand. **3:** 40–54.

Moore, I. and E. F. Legner.

1971. A new genus and species of rove beetle from California (Coleoptera: Staphylinidae). Coleopt. Bull. **25:** 51–53.

1974. Bibliography (1758 to 1972) to the Staphylinidae of America north of Mexico (Coleoptera). *and* Keys to the genera of the Staphylinidae of America north of Mexico exclusive of the Aleocharinae (Coleoptera: Staphylinidae). Hilgardia **42**(16): 511–563.

Steel, W. O.

1955. Notes on the Omaliinae (Col., Staphylinidae) (7) The genus *Xanthonomus* Bernhauer. Entomol. Mon. Mag. **91:** 275–278.